

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

TEST REPORT

SCOPE OF WORK FCC TESTING–CP3504L

REPORT NUMBER 200810037SZN-004

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Intertek Report No.: 200810037SZN-004

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

Application For Certification

FCC ID: R38YLCP3504L

Smartphone

Model: CP3504L

2.4GHz Wi-Fi Transceiver

Report No.: 200810037SZN-004

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-19]

Prepared and Checked by:

Approved by:

Leo Li Project Engineer Peter Kang Senior Technical Supervisor Date: September 10, 2020

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Intertek Testing Services Shenzhen Ltd. Longhua Branch

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Intertek Report No.: 200810037SZN-004

MEASUREMENT/TECHNICAL REPORT

This report concerns (check one) Original Grant <u>X</u> Class II Change
Equipment Type: <u>DTS - Part 15 Digital Transmission Systems (Wi-Fi transmitter portion)</u>
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes NoX_
If yes, defer until : date Company Name agrees to notify the Commission by:
date
of the intended date of announcement of the product so that the grant can be issued on that date.
Transition Rules Request per 15.37? Yes NoX
If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-19] Edition] provision.
Report prepared by:
Leo Li Intertek Testing Services Shenzhen Ltd. Longhua Branch 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China. Tel: (86 755) 8614 0743 Fax: (86 755) 8601 6661



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1.0 Summary of Test results

Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd Applicant Address: Building B, Boton Science Part Chaguang Road, Xili Town, Nanshan District Shenzhen, China

TEST ITEM RESULTS REFERENCE Max. Output power 15.247(b)(3) Pass 15.247(a)(2) Pass 6 dB Bandwidth Max. Power Density 15.247(e) Pass Out of Band Antenna Conducted Emission 15.247(d) Pass 15.247(d), 15.209, Radiated Emission in Restricted Bands Pass FCC 15.205 15.207 **AC Conducted Emission** Pass Pass Antenna Requirement 15.203 (See Notes)

Model: CP3504L FCC ID: R38YLCP3504L

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

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2.0 General Description

2.1 Product Description

CP3504L is subscriber equipment in the GSM/UMTS/LTE system. The GSM frequency band includes GSM850 and DCS1800 and PCS1900. but only GSM850/1900 test data included in this report. The UMTS frequency band is band I and band II and band IV and band V, but only band II and Band IV and Band V test data included in this report. The LTE frequency band is Band I and Band II and band III band IV and band V and band VII and Band XII and Band XIII and Band XVII and Band XXVIII, but only Band II and band IV and band V and band VII and Band XII and Band XIII and Band XVII test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, Bluetooth and Wi-Fi etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices. Bluetooth and Wi-Fi transmitters are share one antenna while they can't transmit simultaneously. The EUT is powered by DC 3.8V by rechargeable battery and charged by AC 120V/60Hz. For more detailed features description, please refer to the user's manual.

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM; CCK, DQPSK, DBPSK for DSSS. Antenna Type: Integral Antenna Antenna Gain: 0.6dBi

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of a transceiver for the Smartphone 2.4GHz WIFI function.

For the GSM/WCDMA/LTE mode was tested and demonstrated in report 200810037SZN-001. For the BT 4.2 EDR mode was tested and demonstrated in report 200810037SZN-002. For the BT 4.2 BLE mode was tested and demonstrated in report 200810037SZN-003. For other functions were reported in the SDOC report: 200810037SZN-006.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application.



2.4 Test Facility

The Semi-anechoic chamber and shielded room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.



3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT is powered by DC 3.8V by rechargeable battery and charged by AC 120V/60Hz during the test, only the worst data was reported in this report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meters reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The rear of unit was flushed with the rear of the table.

Radiated emission measurement was performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

Test software: Nonsignaling operation platform

3.3 Special Accessories

USB cable (Shielded, Length 75cm)



3.4 Equipment Modification

Any modifications installed previous to testing by Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.5 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

3.6 Support Equipment List and Description

Description	Manufacturer	Remark			
Power Adapter	SHENZHEN TIANYIN ELECTRONICS CO., LTD	Model: TPA-46050200UU Input: 100-240V~, 50/60Hz, 0.3A Output: DC 5V, 2000mA			
USB cable	Provided by applicant	Shielded, Length: 75cm			



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: August 21, 2020Model: CP3504L

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter has a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 0.6dBi) (CCK, 1Mbps)										
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt								
Low Channel: 2412	15.6	36.3								
Middle Channel: 2437	17.0	50.1								
High Channel: 2462	16.5	44.7								

IEEE 802.11g (Antenna Gain = 0.6dBi) (16QAM, 6Mbps)										
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt								
Low Channel: 2412	18.9	77.6								
Middle Channel: 2437	19.1	81.3								
High Channel: 2462	20.1	102.3								

IEEE 802.11n-HT20 (Antenna Gain = 0.6dBi) (16QAM, 6.5Mbps)										
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt								
Low Channel: 2412	18.3	67.6								
Middle Channel: 2437	18.9	77.6								
High Channel: 2462	19.4	87.1								

Cable loss: 0.5 dB External Attenuation: 0 dB Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 20.1dBm EUT max. radiated output level = 20.1dBm + 0.6dBi = 20.7dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: August 21, 2020Model: CP3504L

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)									
Frequency (MHz)	6 dB Bandwidth (MHz)								
2412	9.551								
2437	9.551								
2462	9.551								

IEEE 802.11g (16QAM, 6Mbps)									
Frequency (MHz)	6 dB Bandwidth (MHz)								
2412	16.454								
2437	16.454								
2462	16.107								

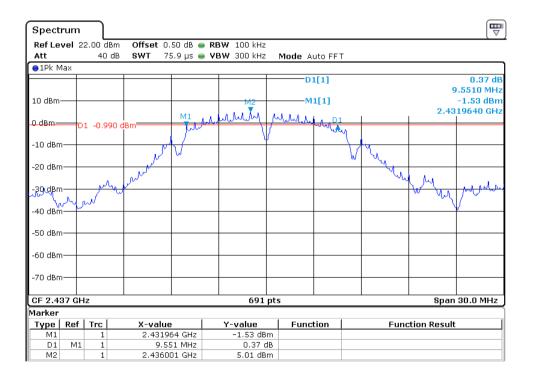
IEEE 802.11n-HT20 (64QAM, 6Mbps)									
Frequency (MHz)	6 dB Bandwidth (MHz)								
2412	17.670								
2437	17.323								
2462	17.453								

The test plots are attached as below.

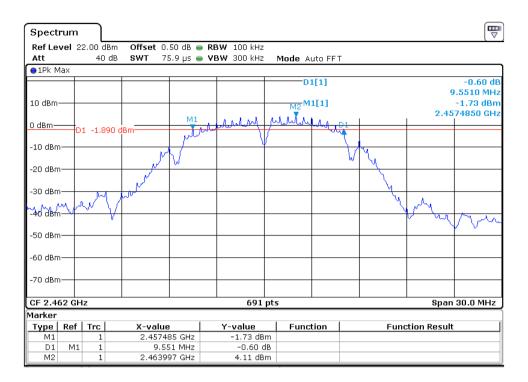


802.11b

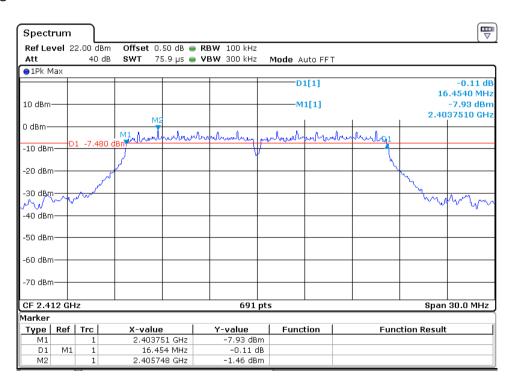
₩ Spectrum Ref Level 22.00 dBm Offset 0.50 dB 👄 RBW 100 kHz 40 dB SWT 75.9 µs 👄 **VBW** 300 kHz Mode Auto FFT Att ⊖1Pk Max 1.45 dB 9.5510 MHz -D1[1] -3.35 dBm M1[1] 10 dBm 2.4069640 GH N. W W. L.A.A the they M-0 dBm-01 -2.770 dBm W -10 dBm -20 dBm· ī, -30 dBm-N M -40 dBm--50 dBm--60 dBm--70 dBm-Span 30.0 MHz 691 pts CF 2.412 GHz Marker Type | Ref | Trc | X-value Y-value Function **Function Result** M1 D1 2.406964 GHz 9.551 MHz -3.35 dBm M1 1.45 dB 1 2.41048 GHz 3.36 dBm M2 1





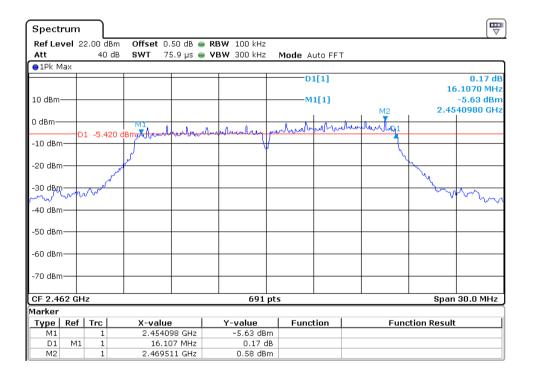


802.11g





Spect	rum														
Ref Lev Att	vel 2	2.00 dB 40 (_		100 kHz 300 kHz		lode Au	uto FF1	г					
⊖1Pk M	lax														
								D1	l[1]						1.27 dB
10 dBm-								M	1[1]						.4540 MHz -6.68 dBm
to abiii				M2					-(-)						87080 GHz
0 dBm—			MIA		0-0-0-			1 1	h	-	0 6 -	-			
	— D	1 -5.43	o demander	novun	- work	morely	pur	Mrrand by	MM	she	henty				
-10 dBm						`	1								
-20 dBm												Z			
-20 0011	unv	www	·										Win	Maan	mun
-20 dBm -30 dBm															www.W
-40 dBm															
-50 dBm															
00 abiii	.														
-60 dBm															
-70 dBm	·														
CF 2.43						691	nte								30.0 MHz
Marker	57 GF	2				091	pes			_				pan	30.0 MHZ
Type	Ref	Trc	X-value	.	Y-value Function				Function Result				1		
M1		1	2.4287			-6.68 dB	m								
D1	M1	1		54 MHz		1.27 (
M2		1	2.4320	07 GHz		0.57 dB	sm								





802.11n-HT20

Spectrum Ref Level 22.00 dBm Offset 0.50 dB 👄 RBW 100 kHz 75.9 μs 👄 VBW 300 kHz 40 dB SWT Mode Auto FFT Att ●1Pk Max 0.74 dB 17.6700 MHz D1[1] -9.62 dBm 10 dBm--M1[1] 2.4031430 GH 0 dBm-M1. my Jul hours Angle March whent mala D1 -8.600 d3 -10 dBm— -20 dBm-Խ -30 dBm-۲m mom V40 dBm -50 dBm--60 dBm--70 dBm— Span 30.0 MHz 691 pts CF 2.412 GHz Marker Type | Ref | Trc | Y-value Function Function Result X-value M1 D1 M2 2.403143 GHz 17.67 MHz 2.405748 GHz -9.62 dBm 0.74 dB -2.60 dBm 1 Μ1 1 1

Spect	rum									
Ref Lev Att	vel 2	2.00 dB 40 d			RBW 100 kHz VBW 300 kHz			-		
O 1Pk M	59	40 (3 3 1 1	5.9 µ5 🖶	VDVV 300 KH2	MOUE A				
UTEK IVI							1[1]			0.38 dB
							-(-)		1	7.3230 MHz
10 dBm-						м	1[1]		_	-6.52 dBm
					M2				2.42	81870 GHz
0 dBm—				6	_	0.0				
	— D	1 -6.26) dem marchand	moun	www.mahing	poursonale	may	hon Low Low		
-10 dBm			1			(_		
			J						5	
-20 dBm		al s							No.	
man when	W	me							- www.	Managend
-20 dBm . ନଟଡ଼ ଏ Bm	-									Lan and am
-40 dBm										
-40 ubiii										
-50 dBm										
-60 dBm										
-70 dBm										
CF 2.43	37 GH	z			691	pts			Spar	30.0 MHz
Marker										
Туре	Ref		X-value		Y-value	Func	tion	Fun	ction Result	t
M1		1		.87 GHz	-6.52 dE					
D1	M1	1		23 MHz	0.38					
M2		1	2,4357	41 GHz	-0.26 dB	sm				



Spectr	um												
Ref Lev	/el 2	2.00 dBn	n Offset 0.	50 dB 🧉	RBW	100 kHz							
Att		40 dE	3 SWT 75	6.9 μs 🧉	VBW	300 kHz	r r	Mode Au	uto FF1	Г			
⊖1Pk M	ax												
								D1	[1]				0.63 dB
												17	7.4530 MHz
10 dBm-								——M:	L[1]				-7.05 dBm
											M2	2.45	33600 GHz
0 dBm—			M1					<u>α λ</u>	. 1	A	howling		
	—D	1 -6.600	dBmr.And	معهر المهم	A way	montheasy	M	a Constant by	and where	1000	~งกามเปลาหมู่.		
-10 dBm			1				ľ						
00 d0			r]					n,	
-20 dBm		7	,,,,,,,									1	
20 d0 m		18 M										N.	
-30 dBm	0	N										W. M	home
-40 dBm	w	V.											moun
-40 ubiii													
-50 dBm													
50 GDIII													
-60 dBm			_										
-70 dBm													
CF 2.46	2 GF	łz	1			691	pts					Span	30.0 MHz
Marker													
Type	Ref	tef Trc X-value Y-value Function						ion		Fund	tion Result	. 1	
M1		1	2.453	36 GHz		-7.05 dB	m						
D1	M1	1		3 MHz		0.63 (
M2		1	2.4695	l1 GHz		-0.60 dB	m						



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: August 21, 2020Model: CP3504L

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 8dBm/3 kHz.

IEEE 802.11b (CCK, 1Mbps)							
Frequency (MHz)	Power Density with RBW 100KHz						
2412	3.12						
2437	4.94						
2462	4.06						

IEEE 802.11g (16QAM, 6Mbps)							
Frequency (MHz)	Power Density with RBW 3KHz						
2412	-1.42						
2437	0.57						
2462	0.61						

IEEE 802.11n-HT20 (16QAM, 6.5Mbps)						
Frequency (MHz)	Power Density with RBW 3KHz					
2412	-2.65					
2437	-0.34					
2462	-0.54					

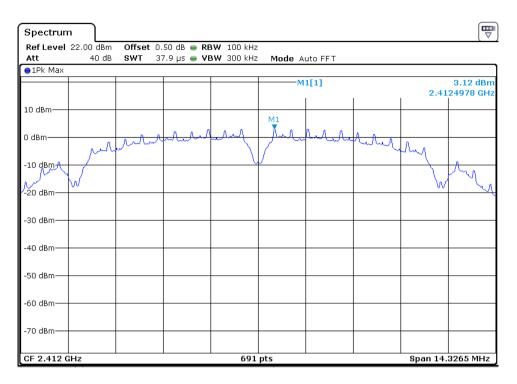
Cable loss: 0.5 dB External Attenuation: 0 dB

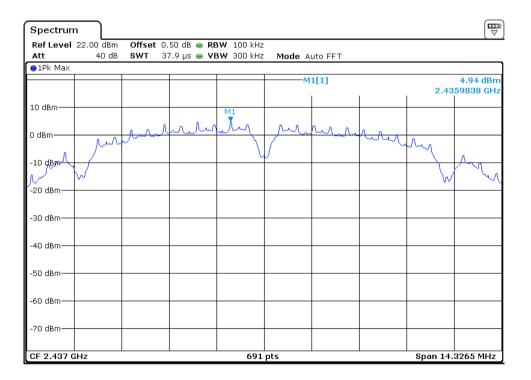
Cable loss, external attenuation has been included in OFFSET function

The test plots are attached as below.

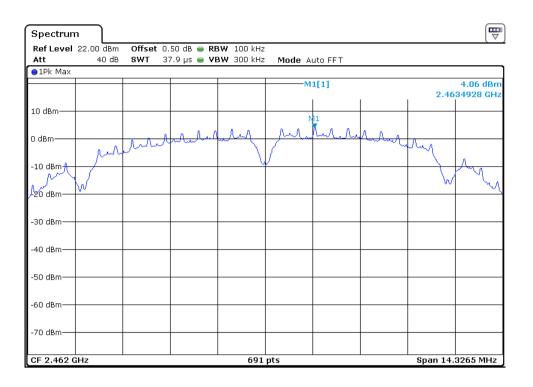


802.11b

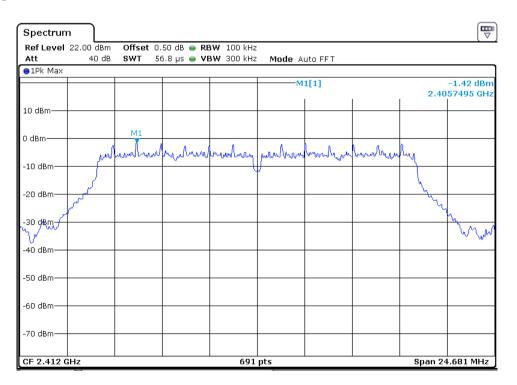






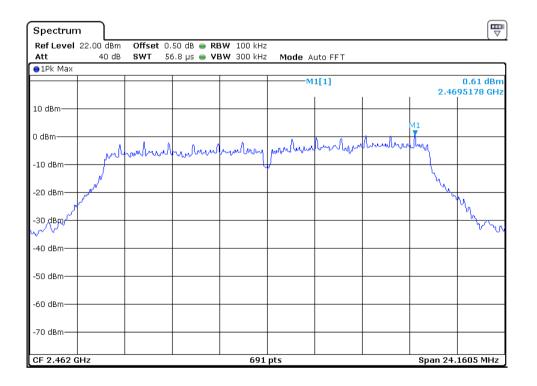


802.11g



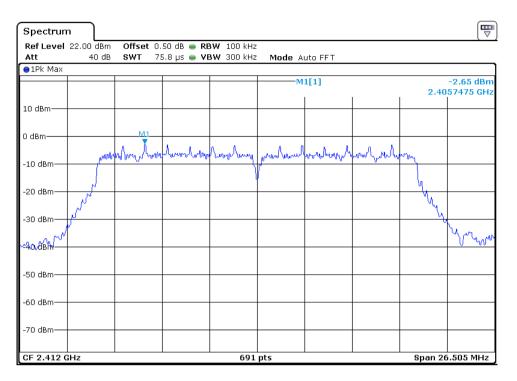


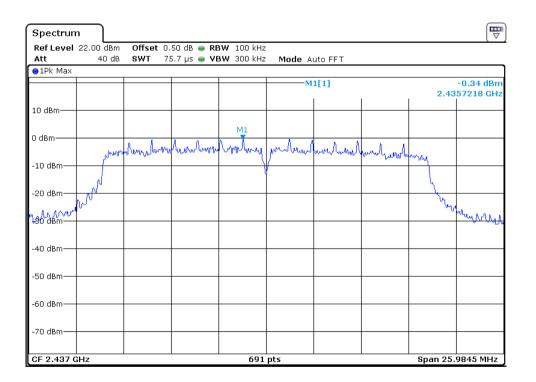
Spectrum	ר						
Ref Level 22.0		.50 dB 👄 RBW 🗄					
	40 dB SWT 5	6.8 µs 👄 VBW (300 kHz Mode A	uto FFT			
●1Pk Max				11[1]			0.57 dBm
			I¥.	11[1]		2.43	82505 GHz
10 dBm							
			M1				
0 dBm	montun	nutrun	atring permition	hours	huntur	ling	
-10 dBm	- <u>_</u>		γ				
	۲					<i>ч</i> .,	
-20 dBm						, where the second	Max.
www							mun
-30 dBm							
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 2.437 GHz			691 pts			Span 24	.681 MHz





802.11n-HT20







Spectrun	n								
Ref Level	22.00 dBm	Offset 0	.50 dB 🔵 RE	3W 100 kHz					
Att	40 dB	SWT 7	5.8 µs 👄 VE	3W 300 kHz	Mode A	uto FFT			
⊖1Pk Max									
					M	1[1]		2.46	-0.54 dBm 95013 GHz
10 dBm									
0 dBm						· · · · ·	M1		
-10 dBm	rnah	Monthan	Awahutu	Andry	produced	www.www.	www.yowy	www.y	
)	l			h h	
-20 dBm—	and the second s							Wy.	
-30 dBm	f ^{ar}								Money
-40 dBm									" here
-50 dBm									
-60 dBm									
-70 dBm									
CF 2.462 C	Hz			691	pts			Span 26.	1795 MHz



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: August 21, 2020Model: CP3504L

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6Mbps for 802.11n-HT20.

The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.



SISO Mode, Ant1:

802.11b

Channel 01 (2412MHz) Reference Level: 3.12dBm

Spectrun	n								
Ref Level Att	22.00 dBm 40 dB	Offset C SWT	.50 dB 👄 RE 24 ms 👄 VI			uto Sweep			
●1Pk Max	40 00	3111	24 115 🚽 🕇	JW 300 KHZ	HOUE A	uto sweep			
					M	1[1]			35.12 dBm 39830 GHz
10 dBm									
0 dBm									
-10 dBm									
-20 dBm	D1 -16.880	dBm							
-30 dBm									M
-40 dBm									
_J ŞQ,d&mbv~	pathone for the second	tour about the state	ليلطط فعروقها	and and the state	whenter	And when the stand the	-		Whenton
-60 dBm									
-70 dBm									
Start 1.0 M	/ 1Hz			691	pts			Sto	p 2.4 GHz

Spectrun	n								
	22.00 dBm		50 dB 👄 RE						
Att 1Pk Max	40 dB	SWT 2	26 ms 👄 🛛	3W 300 kHz	Mode A	uto Sweep			
DIPK Max					м	1[1]			43.09 dBn).1285 GH;
10 dBm									
0 dBm									
-10 dBm—									
-20 dBm—	D1 -16.880	dBm							
-30 dBm									
-40 dBm							M1		
490 dBm	ardenmerson	yuuuuuuyuyuu	human har	hunnutury	monyonworder	Warman	nuenonaly	www.wahu	munhop
-60 dBm									
-70 dBm—									
Start 2.48	35 GHz			691	pts			Stop	25.0 GHz



Spectrum						
Ref Level 22.00 d		RBW 100 kHz				
Att 40	dB SWT 113.8 µs 👄 '	VBW 300 kHz	Mode Auto FF	Т		
●1Pk Max						
		1 1	D1[1]			-37.42 dB
			A41543		-10	.9990 MHz 3.30 dBm
10 dBm		++	M1[1]		2.41	04920 GHz
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-10 dBm			, per		whythy	
			J.V.		h.	
-20 dBm		1 1	P		<u> </u>	
-30 dBm			- H - J		1	
		wv	\mathcal{A}			M.
-40 dBm		and part of				u wy
-591 dAmon render	and	V				
-60 dBm						
-70 dBm						
CF 2.4 GHz		691	ots	I	Span	50.0 MHz



Channel 06 (2437MHz) Reference Level: 4.94dBm

Spectrum	ך				
Ref Level 22.0 Att		50 dB 🔵 RBW 100 kHz 24 ms 🖷 VBW 300 kHz			
●1Pk Max					
			M1[1]		7.98 dBm 8.00 MHz
10 dBm					
0 dBm					
-10 dBm					
-20 dBm	15.060 dBm				
-30 dBm					
-40 dBm					
59,9800	Haritan	and a start and the start and	المتحر المتازلين والمسائط والمتأسط	unitouting	-
-60 dBm					
-70 dBm					
Start 1.0 MHz		691	nts	Ston	2.4 GHz

Spectrun	n								
Ref Level Att	22.00 dBm 40 dB	Offset 0. SWT 22		3W 100 kHz 3W 300 kHz		uto Sweep			` · ·
●1Pk Max	I	I		I		•			
					M	1[1]	1		42.92 dBm 5.8665 GHz
10 dBm									
0 dBm									
-10 dBm—									
-20 dBm	D1 -15.060	dBm							
-30 dBm									
-40 dBm	M								
-90 dBm-	mound	Maringulo	www.huh	makhilulyourde	nuthenath	undrower hade	hundering	www.www.wa	ndpronound
-60 dBm									
-70 dBm									
Start 2.48	35 GHz			691	pts			 Stop	25.0 GHz



Channel 11 (2462MHz) Reference Level: 4.06dBm

Spectrun	n								
Ref Level Att	22.00 dBm 40 dB		.50 dB 👄 RE 24 ms 👄 VE		Mode A	uto Sweep			
⊖1Pk Max									
					M	1[1]			47.42 dBm 70.70 MHz
10 dBm									
0 dBm									
-10 dBm—									
-20 dBm—	D1 -15.940	dBm							
-30 dBm—									
-40 dBm—	M1								
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-60 dBm—									
-70 dBm—									
Start 1.0 M	 /IHz			691	pts			Sto	p 2.4 GHz

Spectrum	₩)
Ref Level 22.00 dBm Offset 0.50 dB RBW 100 kHz Att 40 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep	
●1Pk Max	٦
M1[1] -42.99 d 6.9315 (
10 dBm	
0 dBm	_
-10 dBm	_
-20 dBm	
-30 dBm	_
-40 dBm	_
nsortem when we want want want want want want want want	nw
-60 dBm	
-70 dBm	
Start 2.4835 GHz 691 pts Stop 25.0 Gl	_



Intertek Report No.: 200810037SZN-004

Spectrun	n																
Ref Level	22.00 dBm	Offset 0	.50 dB 😑 R	BW 100 kH	z												
Att	40 dB	SWT 13	32.7 µs 😑 V	' BW 300 kH	z Mode /	Auto FFT											
●1Pk Max									1								
	D1[1] -50.31 dB																
								44	.1970 MHz								
10 dBm					M	1[1]			3.00 dBm								
10 000	M1					ı		2.46	35290 GHz								
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-20 dBm—																	
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-40 dBm			r In No														
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-50 dBm				William marily	ptome pt	norma	y ratured	ryww	- Marchage								
					Ĩ		v.	Ĩ									
-60 dBm																	
70 d0m																	
-70 dBm																	
CF 2.4835	GHz			691	pts			Span	GF 2.4835 GHz 691 pts Span 60.0 MHz								



802.11g

Channel 01 (2412MHz) Reference Level: -1.42dBm

₩ Spectrum Ref Level 17.50 dBm Offset 0.50 dB 👄 RBW 100 kHz 24 ms 🖷 VBW 300 kHz Att 35 dB SWT Mode Auto Sweep 😑 1Pk Max -33.84 dBm 2.39830 GHz M1[1] 10 dBm· 0 dBm--10 dBm· -20 dBm— D1 -21.420 dBm--30 dBm--40 dBm--50 dBmhumble unaholyce JEARAN. unorthan windungpaper whet and water www. weenhour mphander -60 dBm--70 dBm--80 dBm-Start 1.0 MHz 691 pts Stop 2.4 GHz

Spectrun	n								
Ref Level	17.50 dBm	Offset 0	.50 dB 🔵 RE	3W 100 kHz					
Att	35 dB	SWT 2	26 ms 👄 ۷	3W 300 kHz	Mode A	uto Sweep			
⊖1Pk Max									
10 dBm					М	1[1]			47.83 dBm 5.8015 GHz
0 dBm									
-10 dBm—									
-20 dBm	D1 -21.420	dBm							
-30 dBm									
-40 dBm									
-50 dBm	M1								
400 -		mound	multiprive	whilework	ut would be	Munuha	mullitur	de moner	Ma round be
-60 dBm—									
-70 dBm—									
-80 dBm—									
Start 2.48	35 GHz			691	pts			Stop	25.0 GHz



Spectrun	ī								
Ref Level	22.00 dBm	Offset	0.50 dB 👄 R	BW 100 kH	z				
Att	40 dB	SWT	132.7 µs 👄 V	' BW 300 kH	z Mode /	Auto FFT			
⊖1Pk Max									
					D	1[1]			-29.95 dB
								-(5.9460 MHz
10 dBm					M	1[1]		0.40	-1.53 dBm)57310 GHz
						1	1	2.40	137310 GH2
0 dBm					М	L			
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-10 dBm						0.0000.00.00.00.00	N Wardsong		
-10 0011							9		
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-60 dBm									
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70 40									
-70 dBm									
CF 2.4 GHz	2			691	pts			Spar	160.0 MHz



Channel 06 (2437MHz) Reference Level: 0.57dBm

Spectrur	n									
Ref Level	22.00 dBm	Offset 0	.50 dB 😑 RE	3 W 100 kHz						
Att	40 dB	SWT	24 ms 🔵 🛛	3W 300 kHz	Mode A	uto Sweep				
⊖1Pk Max										
					M	1[1]			47.41 dBm 04080 GHz	
10 dBm										
0 dBm										
-10 dBm—										
20 dBm	D1 -19.430	dBm								
-30 dBm—										
-40 dBm—										
759 dBmoto	-	man	alve-Muturd ania	M1	ulikunturtut	manguite	artandartadaat	alumont the	ntractor notice and	
-60 dBm										
-70 dBm										
Start 1.0 🛚	Start 1.0 MHz 691 pts Stop 2.4 GHz									

Spectrun	n								
Ref Level	22.00 dBm	Offset 0	.50 dB 🔵 RE	3 W 100 kHz					
Att	40 dB	SWT 2	26 ms 👄 🛛	3W 300 kHz	Mode A	uto Sweep			
⊖1Pk Max									
					M	1[1]	1		42.89 dBm /.6845 GHz
10 dBm									
0 dBm									
-10 dBm									
- -20 dBm	ŧD1 -19.430	dBm							
-30 dBm									
-40 dBm						M1			
190 dBm	monder	ylune when the	munder	manundul	haberto	www.hu	hanner	um maken	million
-60 dBm									
-70 dBm									
									25.0.011
Start 2.48	35 GHZ			691	pts			Stop	25.0 GHz

Channel 11 (2462MHz) Reference Level: 0.61dBm

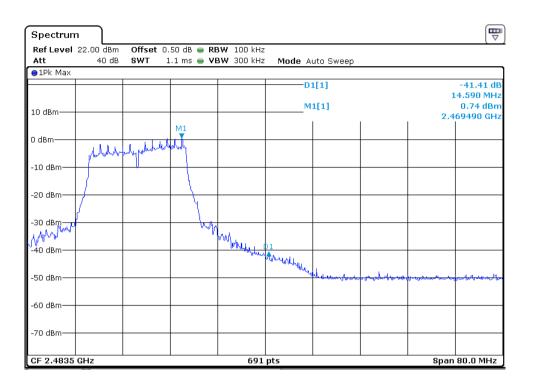


Intertek Report No.: 200810037SZN-004

Spectrun	Spectrum 🕎									
	22.00 dBm		50 dB 👄 RE							
Att	40 dB	SWT	24 ms 😑 VE	3W 300 kHz	Mode A	uto Sweep				
⊖1Pk Max										
					M	1[1]			47.31 dBm 06510 GHz	
10 dBm										
0 dBm										
-10 dBm										
-20 dBm	D1 -19.390	dBm=====								
-30 dBm										
-40 dBm				M1						
,-5Q,d8m	and the second	tor to the second days	where and the second	uth John w	www.	moherence	yin and her wood an		rownwallwahad	
-60 dBm										
-70 dBm										
Start 1.0 M	1Hz			691	pts			Sto	p 2.4 GHz	

Spectrum	τ								
Ref Level Att	22.00 dBm 40 dB		50 dB 👄 RE 26 ms 👄 VE			uto Sweep			
●1Pk Max					М	1[1]		-	42.93 dBm
						1	l	19	9.6725 GHz
10 dBm									
0 dBm									
-10 dBm									
-20 dBm	D1 -19.390	dBm							
-30 dBm									
-40 dBm							M1		
∿5¢°dBm	would when whether	youpond	yuunuu	ununun	Munnunnun	Murundur	numulion	when the	www.while
-60 dBm									
-70 dBm									
Start 2.48	35 GHz			691	pts			Stop	25.0 GHz

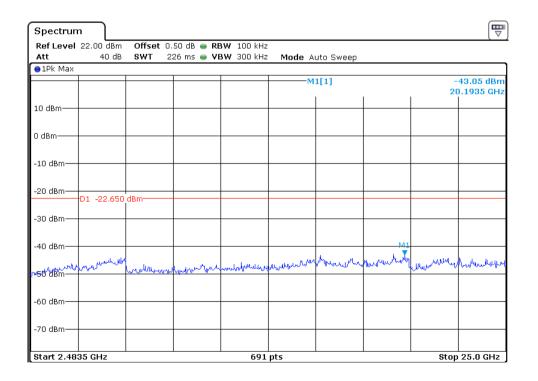






802.11n-HT20 Channel 01 (2412MHz) Reference Level: -2.65dBm

₩ Spectrum Ref Level 22.00 dBm Offset 0.50 dB 🖷 RBW 100 kHz SWT Att 40 dB 24 ms 👄 **VBW** 300 kHz Mode Auto Sweep ⊖1Pk Max M1[1] -38.98 dBn 2.39830 GH 10 dBm 0 dBm -10 dBm· -20 dBm-D1 -22.650 dBm--30 dBm--40 dBm-Wundertunger altrior that TEO dBuyt Mallan walward -60 dBm· -70 dBm-Start 1.0 MHz 691 pts Stop 2.4 GHz 1.08.2020 Measuring...





D1[1] -34.36 dB -6.8600 MHz -6.8600 MHz -6.8600 MHz -2.4057310 GHz 0 dBm -10 dBm -20 dBm	Spectrun	ī								
19k Max 10 dBm 10 d	Ref Level	22.00 dBm	Offset	0.50 dB 👄 R	. BW 100 kH	z				
0 dBm 01[1] -34.36 dB 10 dBm M1[1] -2.60 dBm 0 dBm 0 dBm 0 -10 dBm 0 0 -20 dBm 0 0 -30 dBm 0 0 -60 dBm 0 0	Att	40 dB	SWT	132.7 µs 😑 V	' BW 300 kH	z Mode /	Auto FFT			
-10 dBm -10 dBm -10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -6.0 dBm -7.0 dBm -7.	●1Pk Max									
10 dBm M1[1] -2.60 dBm 0 dBm						D	1[1]			-34.36 dB
10 dBm 2.4057310 GHz 0 dBm									-6	5.8600 MHz
0 dBm	10 dBm					M	1[1]			-2.60 dBm
-10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -60 dBm -60 dBm	TO UBIII								2.40	57310 GHz
-10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -60 dBm -60 dBm										
-10 dBm -20 dBm -30 dBm -40 dBm -40 dBm -60 dBm	0 dBm					M				
-10 dBm -20 dBm -30 dBm -40 dBm -40 dBm -60 dBm						Alm	beharrender.	helselik	ruly	
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-30 dBm										
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-40 dBm	-30 dBm								<u>↓</u>	
-40 dBm					D1	1			Ն	
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	1 * 1	. V								
	-60 dBm									
-70 dBm	00 00m									
-70 dBm										
	-70 dBm									
CF 2.4 GHz 691 pts Span 60.0 MHz	CF 2.4 GHz	2		I	691	pts	I	I	Span	60.0 MHz



Channel 06 (2437MHz) Reference Level: -0.34dBm

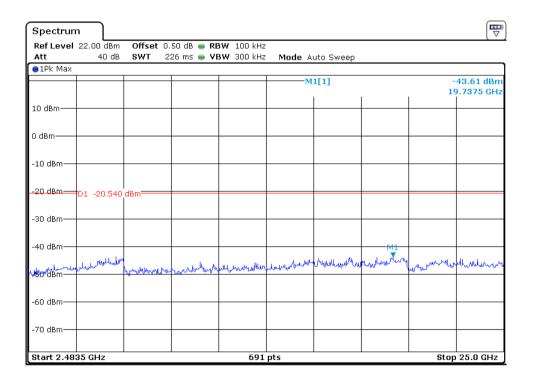
Spectrun	n								
Ref Level Att	22.00 dBm 40 dB		.50 dB 👄 RE 24 ms 👄 VE			uto Sweep			
91Pk Max	40 UB	3991	24 IIIS 🛑 ¥E	344 300 KHZ	MOUE A	uto sweep			—
					м	1[1]			47.48 dBm 22810 GHz
10 dBm									
0 dBm									
-10 dBm—									
20 dBm	D1 -20.340	dBm							
-30 dBm—									
-40 dBm—									M1
150.dBMm	hrandrade	wahren	holstyllionalethold	hadandak danga tang	rungubahunat	holmhluhaile	howwww.		-
-60 dBm—									
-70 dBm—									
Start 1.0 M	/IHz			691	pts	1	1	Sto	p 2.4 GHz

Spectrun	n								
Ref Level	22.00 dBm	Offset 0.	50 dB 😑 RE	SW 100 kHz					
Att	40 dB	SWT 2	26 ms 😑 VE	3W 300 kHz	Mode A	uto Sweep			
😑 1Pk Max]
					M	1[1]			43.28 dBm 5.8985 GHz
10 dBm									
0 dBm									
-10 dBm									
-20 dBm	D1 -20.340	dBm 							
-30 dBm									
-40 dBm	м	1							
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-60 dBm									
-70 dBm—									
Start 2.48	35 GHz	1		691	pts	1	1	Stop	25.0 GHz



Intertek Report No.: 200810037SZN-004 Channel 11 (2462MHz) Reference Level: -0.54dBm

Spectrum	ı ı								
Ref Level			.50 dB 😑 RE						
Att	40 dB	SWT	24 ms 😑 VE	3W 300 kHz	Mode A	uto Sweep			
●1Pk Max			1						
					M	1[1]			47.17 dBm 199.10 MHz
10 dBm									
0 dBm									
-10 dBm									
-20 dBm	D1 -20.540	dBm 							
-30 dBm									
-40 dBm									
J59_d&minuted	ulpor del vocen	ontown worth in	with water and with the	M1	unoment	unana tara	hand with the state	-	bingen hachweiser
-60 dBm									
-70 dBm									
Start 1.0 M	IHz			691	pts			Sto	p 2.4 GHz





Intertek Report No.: 200810037SZN-004

Spectrun	<u>n</u>							
-	22.00 dBm	Offset 0.	50 dB 👄 RE	W 100 kHz				(*)
Att	40 dB			3W 300 kHz	Mode A	uto Sweep		
●1Pk Max								
					D	1[1]		-42.62 dB
								5.050 MHz
10 dBm					M	1[1]		-2.10 dBm
						I	2.4	69490 GHz
0 dBm			M1					
o abili		rlychold	1					
10.10	malility	rly alakaran	- Charles					
-10 dBm—		V						
-20 dBm—								
	J							
-30 dBm	(
/			h.					
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v1~(~ · II - · · ·				West	D1			
-50 dBm				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	M hunger have	bud an all a	 م دارما روانه.	e and he
-30 ubm						0.000-00 0000	 	a trade a contrar a
-60 dBm								
-70 dBm—								
CF 2.4835	GHz			691	pts	-	Span	80.0 MHz



4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

- [×] Not required, since all emissions are more than 20dB below fundamental
- [] See attached data sheet



4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.



4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

WhereFS = Field Strength in $dB\mu V/m$ RA = Receiver Amplitude (including preamplifier) in $dB\mu V$ CF = Cable Attenuation Factor in dBAF = Antenna Factor in dBAG = Amplifier Gain in dBPD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 62.0 dBμV AF = 7.4 dB CF = 1.6 dB AG = 29.0 dB PD = 0 dB FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dB μ V/m)/20] = 125.9 μ V/m



Intertek Report No.: 200810037SZN-004

Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504L

4.8 Radiated Spurious Emission

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit. Only worst-case is reported.

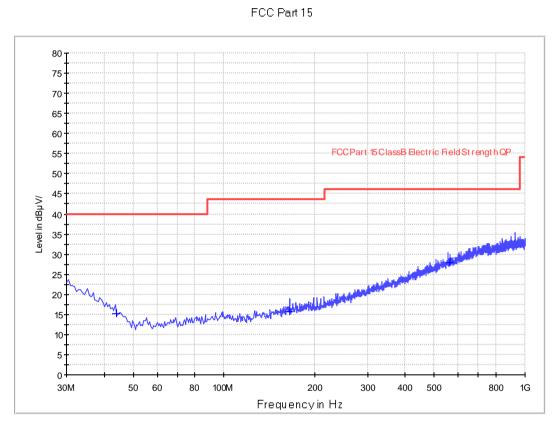
Worst Case Radiated Spurious Emission (SISO ANT1 802.11b-Channel 11) at 2390.000MHz is passed by 7.8dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Wi-Fi Link

ANT Polarity: Horizontal



Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
44.000000	15.2	1000.0	120.000	н	11.1	24.8	40.0
165.315000	15.6	1000.0	120.000	н	12.0	27.9	43.5
562.530000	27.8	1000.0	120.000	н	23.6	18.2	46.0

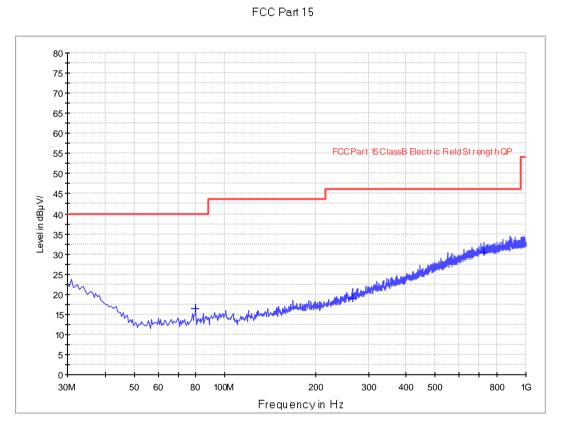
Remark:

- 1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
- 2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
- 3. Margin (dB) = Limit Line(dBµV/m) Level (dBµV/m)



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Wi-Fi Link

ANT Polarity: Vertical



Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
80.000000	16.5	1000.0	120.000	v	9.1	23.5	40.0
265.225000	19.0	1000.0	120.000	v	15.4	27.0	46.0
726.945000	30.5	1000.0	120.000	v	26.4	15.5	46.0

Remark:

- 1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
- 2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
- 3. Margin (dB) = Limit Line($dB\mu V/m$) Level ($dB\mu V/m$)



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11b-Channel 01)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	52.6	36.8	33.5	49.3	74.0	-24.7
Horizontal	*2390.000	65.5	36.4	29.1	58.2	74.0	-15.8

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	43.3	36.8	33.5	40.0	54.0	-14.0
Horizontal	*2390.000	51.8	36.4	29.1	44.5	54.0	-9.5

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11b-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	55.9	36.7	33.4	52.6	74.0	-21.4
Horizontal	*7311.000	53.7	36.6	35.8	52.9	74.0	-21.1

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	49.7	36.7	33.4	46.4	54.0	-7.6
Horizontal	*7311.000	43.9	36.6	35.8	43.1	54.0	-10.9

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11b-Channel 11)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	56.2	36.8	33.3	52.7	74.0	-21.3
Horizontal	*7386.000	60.4	36.5	29.3	53.2	74.0	-20.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	48.4	36.8	33.3	44.9	54.0	-9.1
Horizontal	*7386.000	51.2	36.5	29.3	44.0	54.0	-10.0

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11g-Channel 01)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	53.1	36.8	33.5	49.8	74.0	-24.2
Horizontal	*2390.000	70.5	36.4	29.1	63.2	74.0	-10.8

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	42.7	36.8	33.5	39.4	54.0	-14.6
Horizontal	*2390.000	52.0	36.4	29.1	44.7	54.0	-9.3

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11g-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	51.9	36.7	33.4	48.6	74.0	-25.4
Horizontal	*7311.000	52.7	36.6	35.8	51.9	74.0	-22.1

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	43.4	36.7	33.4	40.1	54.0	-13.9
Horizontal	*7311.000	42.6	36.6	35.8	41.8	54.0	-12.2

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11g-Channel 11)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	51.1	36.8	33.3	47.6	74.0	-26.4
Horizontal	*7386.000	59.7	36.5	29.3	52.5	74.0	-21.5

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	43.1	36.8	33.3	39.6	54.0	-14.4
Horizontal	*7386.000	50.2	36.5	29.3	43.0	54.0	-11.0

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11n20-Channel 01)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	51.8	36.8	33.5	48.5	74.0	-25.5
Horizontal	*2390.000	68.5	36.4	29.1	61.2	74.0	-12.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	42.7	36.8	33.5	39.4	54.0	-14.6
Horizontal	*2390.000	51.4	36.4	29.1	44.1	54.0	-9.9

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11n20-Channel 06)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	55.0	36.7	33.4	47.3	74.0	-22.3
Horizontal	*7311.000	55.1	36.6	35.8	52.1	74.0	-19.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	42.8	36.7	33.4	39.0	54.0	-14.5
Horizontal	*7311.000	42.9	36.6	35.8	42.3	54.0	-11.9

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., LtdDate of Test: 25 August 2020Model: CP3504LWorst Case Operating Mode:Transmitting (802.11n20-Channel 11)

Radiated Emissions (above 1GHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	55.3	36.8	33.3	49.1	74.0	-22.2
Horizontal	*7386.000	62.0	36.5	29.3	52.2	74.0	-19.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre- Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	42.5	36.8	33.3	40.1	54.0	-15.0
Horizontal	*7386.000	50.1	36.5	29.3	43.7	54.0	-11.1

- 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.



Intertek Report No.: 200810037SZN-004

Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd Date of Test: 20 August 2020 Model: CP3504L

4.9 Conducted Emission

Worst Case Conducted Emission at 0.510MHz is passed by 13.8dB margin.

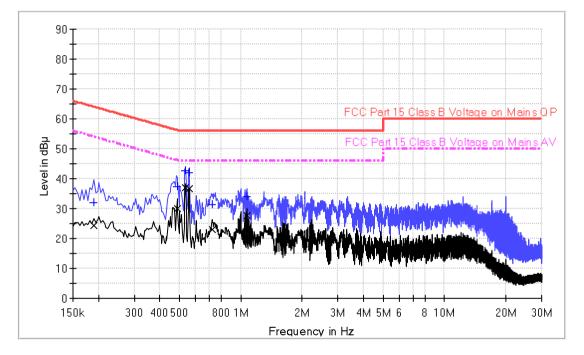
For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd Date of Test: 20 August 2020 Model: CP3504L Worst Case Operating Mode: Wi-Fi Link Phase: Live

Graphic / Data Table

Conducted Emissions Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

	•					
Frequency	QuasiPeak	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBuV)	(kHz)		(dB)	(dB)	(dBuV)
0.190500	31.9	9.000	L1	9.7	32.1	64.0
0.486000	37.3	9.000	L1	9.7	18.9	56.2
0.534000	42.6	9.000	L1	9.7	13.4	56.0
0.558000	41.9	9.000	L1	9.7	14.1	56.0
0.722000	31.3	9.000	L1	9.7	24.7	56.0
1.070000	34.1	9.000	L1	9.7	21.9	56.0

Limit and Margin AV

	0					
Frequency	Average	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBuV)	(kHz)		(dB)	(dB)	(dBuV)
0.190500	24.4	9.000	L1	9.7	29.6	54.0
0.486000	30.1	9.000	L1	9.7	16.1	46.2
0.534000	37.1	9.000	L1	9.7	8.9	46.0
0.558000	36.6	9.000	L1	9.7	9.4	46.0
0.722000	23.1	9.000	L1	9.7	22.9	46.0
1.070000	27.8	9.000	L1	9.7	18.2	46.0

Remark:

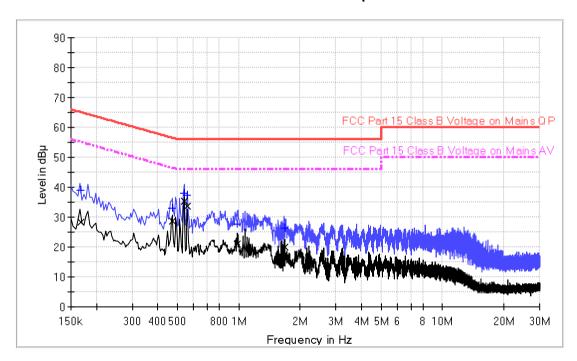
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) = Limit (dBuV) – Level (dBuV)



Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd Date of Test: 20 August 2020 Model: CP3504L Worst Case Operating Mode: Wi-Fi Link Phase: Neutral

Graphic / Data Table



Conducted Emissions Pursuant to FCC 15.207: Emissions Requirement

Limit and Margin QP

Frequency	QuasiPeak	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBuV)	(kHz)		(dB)	(dB)	(dBuV)
0.168000	39.0	9.000	Ν	9.7	26.1	65.1
0.470000	32.9	9.000	Ν	9.7	23.6	56.5
0.538000	38.0	9.000	Ν	9.7	18.0	56.0
0.558000	37.5	9.000	Ν	9.7	18.5	56.0
0.986000	27.8	9.000	Ν	9.7	28.2	56.0
1.678000	26.4	9.000	Ν	9.7	29.6	56.0

Limit and Margin AV

	•					
Frequency	Average	Bandwidth	Line	Corr.	Margin	Limit
(MHz)	(dBuV)	(kHz)		(dB)	(dB)	(dBuV)
0.168000	28.3	9.000	Ν	9.7	26.8	55.1
0.470000	28.7	9.000	Ν	9.7	17.8	46.5
0.538000	35.3	9.000	Ν	9.7	10.7	46.0
0.558000	33.6	9.000	Ν	9.7	12.4	46.0
0.986000	21.1	9.000	Ν	9.7	24.9	46.0
1.678000	19.9	9.000	Ν	9.7	26.1	46.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) = Limit (dBuV) – Level (dBuV)



- 4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109
- [] Not required No digital part
- [] Test results are attached
- [x] Included in the separated report.



4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
х	Not applicable, duty cycle was not used.



5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

6.0 **Product Labeling**

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 <u>Confidentiality Request</u>

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.



TEST REPORT

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	2020-05-27	2021-05-27
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	2020-05-27	2021-05-27
SZ061-12	Biconilog Antenna	ETS	3142E	00166158	2018-09-14	2020-09-14
SZ061-06	Active Loop Antenna	Electro- Metrics	EM-6876	217	2019-05-24	2021-05-24
SZ061-08	Horn Antenna	ETS	3115	00092346	2019-09-07	2021-09-07
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	2019-08-13	2021-08-13
SZ056-03	Spectrum Analyzer	R&S	FSP30	101148	2020-05-27	2021-05-27
SZ185-01	EMI Receiver	R & S	ESCI	100547	2019-12-24	2020-12-24
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	2020-05-27	2021-05-27
SZ188-01	Anechoic Chamber	ETS	RFD-F/A- 100	4102	2018-12-15	2021-12-15
SZ062-02	RF Cable	RADIALL	RG 213U		2020-06-12	2020-12-12
SZ062-05	RF Cable	RADIALL	0.04- 26.5GHz		2020-08-10	2021-02-10
SZ062-12	RF Cable	RADIALL	0.04- 26.5GHz		2020-08-10	2021-02-10
SZ067-04	Notch Filter	Micro- Tronics	BRM50702 -02		2020-05-27	2021-05-27
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2019-10-29	2020-10-29
SZ187-02	Two-Line V- Network	R&S	ENV216	100073	2020-05-27	2021-05-27
SZ188-03	Shielding Room	ETS	RFD-100	4100	2020-01-07	2023-01-07
SZ062-16	RF Cable	HUBER+SUH NER	CBL2-BN- 1m	110127- 2231000	2019-10-30	2020-10-30